stance, that a certain three angles together make two right angles. Again, the demonstration is carried out in connexion with a single typical figure which must be considered movable and to occupy all possible positions if the deductions are to be universally valid, and in this manner the demonstration is said always to involve an *inference from analogy*. Further, *axioms of arrangement* or *disposition*, as Hilbert has termed them, are involved. These and similar subsidiary implications are largely visualistic in character, and the question arises as to how far they may be stripped of their visualistic elements and reduced to purely rational forms. Leibnitz believed he could reproduce by symbolism all the elements involved in the visualistic procedure, but for various reasons Professor Hölder is of the opinion that this is possible only for limited domains. He next considers the doctrine of proportion, and seeks to analyse the assumptions therein involved, one of which he finds to be the axiom that certain geometrical operations can be repeated an indefinite number of times. The idea that the contents of figures of different forms are comparable is in his opinion also in need of demonstration. Considering the method of exhaustions, he concludes that it is impossible to banish indirect demonstrations from geometry, and he is also of the opinion that the demonstrations of mechanics are not essentially different from those of mathematics, inferences from experience and analogy being involved in both, though in varying degree. *µ*.

IMMANUEL KANT'S KRITIK DER REINEN VERNUNFT. Edited by *Benno Erdmann*. Berlin: Druck und Verlag von Georg Reimer. 1900. Pages, xii, 609. Price, 4 marks.

BEITRÄGE ZUR GESCHICHTE UND REVISION DES TEXTES VON KANT'S KRITIK DER REINEN VERNUNFT. Anhang zur fünften Auflage der Ausgabe. By *Benno Erdmann*. Berlin: Druck und Verlag von Georg Reimer. 1900. Pages, 115. Price, 2 marks.

KANT'S CRITIQUE OF PURE REASON. Translated by *F. Max Müller*. New York and London: The Macmillan Co. 1896. Pages, lxxxii, 808.

The fifth edition of Prof. Benno Erdmann's exemplary edition of Kant's *Critique of Pure Reason* is based (1) on a new and thorough collation of the two first original editions, (2) on a thorough collation of the second edition with the third, fourth, and fifth editions in some places, and (3) on a comparison of the second edition with the third, and the fourth with the fifth, in all passages in which the text of the editions subsequent to 1838 gave occasion for suspecting the text of the standard second edition. The great care and labor which Dr. Erdmann has bestowed upon his work sprang from the conviction that previous editors and emendators had erred in two not unessential points. Every editor since Rosenkranz has religiously kept on modernising the text, changing the punctuation and orthography, and even the words of the text. The result has been a rather chaotic con-

dition of things, and even some of the editions which have a very high reputation contain emendations which are entirely foreign to Kant's mode of thought and expression. It may be of interest to note that the well-established tradition of regarding the fifth edition, which was the last that appeared during Kant's lifetime, as authoritative and of special importance has been set aside by Professor Erdmann, who takes pains to show that many errors have crept into all the editions subsequent to the second. But it was the fifth edition that Rosenkranz and Hartenstein, as well as Von Kirchmann, Adickes, and Vörlander fathered either altogether or in part. Dr. Erdmann for his part has gone back to the second edition, and to give some idea of the enormous extent of his labors it need only be said that he has indicated in a special volume printed as an appendix to the main work, and above noted, all the most important variations in the readings and emendations of the other chief editors, and that he has incorporated in an extensive series of footnotes in the work itself the results of his own textual and critical researches. His labors will, in a large measure, supplant those of his predecessors. The volume is, for its size, remarkably cheap.

Prof. Max Müller's English translation of the *Critique*, the second edition of which appeared some four years ago in this country, will be a valuable companion-piece to the German edition of Erdmann. It is a handsome volume, too well known to need comment, and should be accessible to all students. We miss the introduction of Noiré, but that has since been independently published in German.   *μ.*

A BRIEF HISTORY OF MATHEMATICS. An Authorised Translation of Dr. Karl Fink's
    Geschichte der Elementar-Mathematik. By *Wooster Woodruff Beman*,
    Professor of Mathematics in the University of Michigan, and *David Eugene
    Smith*, Principal of the State Normal School at Brockport, N. Y. Chicago :
    The Open Court Publishing Co. 1900. Pages, xii, 333. Price, cloth, $1.50
    net (5s. 6d. net).

Fink's *History of Mathematics* differs in several essential respects from existing English compendia. It is not biographical, it is not a collection of anecdotes of the great mathematicians, nor is it concerned with mathematical history as an integral portion of the general history of civilisation. It is rather a purely logical and systematic exposition of the evolution of the science, considered as an independent and organic whole, as a self-sufficient body of truth, developing along well-defined lines of its own, and having a perfectly definite physiognomy. Much has been gained in an economic respect by this mode of treatment, and it is sufficient to say that Fink's work contains within brief compass and at less cost more that really relates to the substance of mathematical history than any other work of like pretentions now in the field.

It is unnecessasy to comment upon the advantages that redound to mathematical instruction from a study of the history of mathematics. "The clearer view of the science that is afforded the teacher, the aspiration to improve his methods of